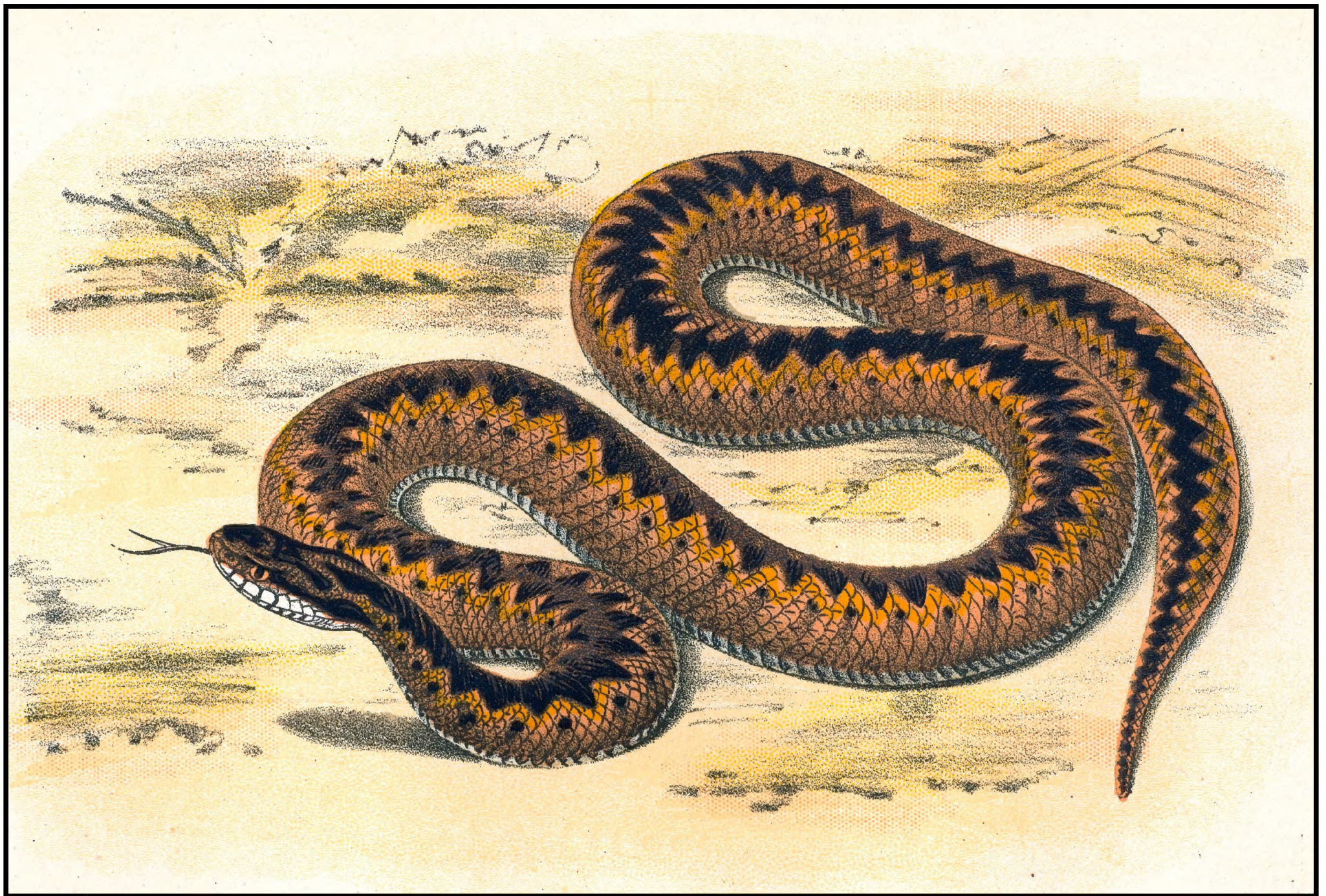

BULLETIN

of the

Chicago Herpetological Society



Volume 56, Number 1
January 2021



BULLETIN OF THE CHICAGO HERPETOLOGICAL SOCIETY

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Possible Cases of Phoresy Involving Leeches and Painted Turtles

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While reviewing catalog information for Wisconsin leech specimens housed in the U.S. National Museum collection, I came across what appeared to be a possible case of phoresy* involving a leech and a turtle. Noted naturalist A. R. Cahn collected two leeches from Fowler Lake in Waukesha County, Wisconsin on 27 July 1927 (Catalog Number: USNM 20388). Leech specialist J. P. Moore later identified these specimens, which were preserved in ethanol, as *Helobdella fusca* (Castle, 1900). *H. fusca* has since been placed in synonymy with *H. triserialis* (Blanchard, 1849) (Christoffersen, 2009). The USNM catalog included the notation “Host: painted turtle.” Being associated with a turtle “host” seemed somewhat unusual as this leech is not known to be parasitic in its feeding habits. Rather, *H. triserialis* feeds on small invertebrates, primarily mollusks (Chernin et al., 1956; Waffle, 1963; Klemm, 1972). In ponds, *H. triserialis* is frequently found attached to the shells of larger species of *Lymnea*, *Physa*, and other snails (Moore, 1912, 1922; Sarah, 1971). As such, I wondered if the record might actually represent a case of phoresy. This interesting catalog record prompted me to consider some unpublished observations recorded in the mid-1990s, as well as some more recent fieldwork, that similarly suggest a phoretic relationship for these species.

During summer and fall 1993 and spring and summer 1994, I surveyed Lake Winneconne in Winnebago County, Wisconsin for amphibians and reptiles and examined turtles that my fisheries management colleagues collected incidental to their work on the lake. On at least three occasions, I observed small leeches on the carapaces of painted turtles (*Chrysemys picta*). These leeches differed from species of *Placobdella*, which have been reported frequently as parasites of turtles (Moser, 1995; Watermolen, 1996; Davy et al., 2009), and I tentatively identified them as “*Helobdella*, no nuchal scute, probably *H. fusca* or *H. lineata*” in my field notes. These species names are now recognized as synonyms of *H. triserialis* (Christoffersen, 2009). One of the turtles was captured in May while basking on a downed tree trunk that extended over the water. The other two were removed from fyke nets set adjacent the lake’s shoreline during the spring. Each turtle had a single leech loosely attached to and crawling on its carapace. No other leeches were found on the exposed skin of the turtles’ necks, legs, or tails or on the plastron. I noted no evidence of feeding (i.e., no blood upwelling at attachment sites, the gastric ceca of the leeches appeared empty).

More recently, several *H. triserialis* were removed from the shells of painted turtles collected in Lake Waubesa in Dane County, Wisconsin during the Milwaukee Public Museum’s June 2018 Bioblitz event. These leeches were similarly loosely attached and exhibited no evidence of feeding.

H. triserialis is widely distributed in North, Central, and South America, is common in the Great Lakes Region, and has previously been reported from Wisconsin in nearby Lake Butte des Morts (Baker, 1924; Klemm, 1991; Christoffersen, 2009). Most other Wisconsin records for this species are from lakes scattered throughout the southern half of the state (unpubl. data). Its broad distribution and metapopulation structure are interesting because the overland movement of leeches between discrete, isolated habitat patches presents significant challenges and has implications for population genetics.

Vertebrates may play a key role in aiding leech dispersal between habitats. For example, attachment of nonfeeding adult leeches to mallards (*Anas platyrhynchos*) has been observed (Davies et al., 1982), and the related *H. stagnalis* Linnaeus, 1758, was recently suggested to have a phoretic relationship with amphibians (Zimić, 2015; Stark et al., 2017). Turtle shells provide platforms for the colonization of diverse aquatic flora and fauna (Edgren et al., 1953; Sazima and Grossman, 2006; Hayashi, 2012; Lindeman, 2017; Wu and Bergey, 2017). The occurrence of leeches on turtle shells is therefore not particularly surprising. The geographically spaced and repeated nature of the observations reported here, however, support the hypothesis that a phoretic relationship involving *H. triserialis* and painted turtles exists. If this is the case, turtle movements across the landscape could facilitate movement of the leeches between habitats.

It is also possible that the leeches may opportunistically exploit the availability of other epibiotic organisms on the turtle shell as a food source. Small mollusks and other soft-bodied invertebrates are occasionally associated with the “biofilm” on turtle shells (personal observation; Lindeman, 2017). Such concentrations of organisms could provide the leech ready access to a food resource that would otherwise be distributed more patchily. I did not, however, observe feeding behavior in any of the above instances.

In either case, the interesting relationship between the painted turtles and their stowaways merits additional investigation.

* Phoresy refers to an association between two different organisms in which one travels on the body of the other without being a parasite.

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Herpetological Art at the Houston Zoo, June 2018

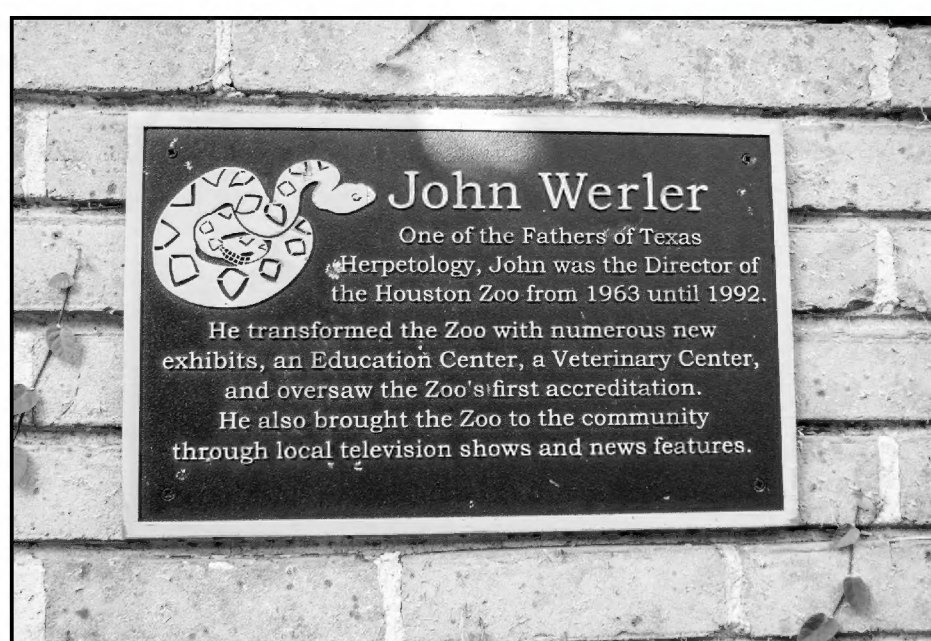
**Photos and story by
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The 41st International Herpetological Symposium was held in Houston, Texas, June 20–23, 2018. One highlight of the symposium was a bus trip to the Houston zoo in Hermann Park for a private, behind-the-scenes tour of the herpetarium. The general public was kept out of the building while we were in there.

In front of the herpetarium are two bronze statues. One is of a frog, and is approximately four feet tall. I like to joke that the frog statue is almost the size of a Smart Car. The second statue is of a cobra that has raised itself up and spread its hood. This statue is on a rock pedestal and stands about five feet tall.

I don't know if there are any other herpetological statues in the Houston Zoo. We didn't go through the front entrance, but were guided through a service entrance or an employee entrance. When we left the bus, we were escorted to the herpetarium and, after that, we were directed to a pavilion where we had dinner and drinks and then back to the buses to return to the hotel.

On a personal note, for herpers who haven't attended any herp conferences, these are great events. There are talks about different aspects of herpetology, many by people who are doing scientific research in the field. Some of these talks are technical and scientific but not too bad and we get to socialize with people who share our interest in herpetology, and, after the final night's banquet, there is an auction of some nice herpetological collectables: books, posters, figurines, etc. The auction can get a little out of hand in a very humorous way. The conferences are a great social event and can be a lot of fun.



Herpetological Art at the Louisville, Kentucky, Zoo — May 2018

Photos and story by
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Right next to the Louisville Zoo's enclosure for its Aldabra tortoises is a statue made from some sort of white stone (Figure 1). It's not an accurate representation of an Aldabra tortoise. I think of it as a caricature, but it is the size of an adult tortoise.

Near the enclosure for the Komodo dragon is a bronze statue (Figure 2), about the size of an adult Komodo dragon. It's a very good likeness of an adult dragon.

Just outside the entrance of the reptile building is a bronze statue of a Jackson's chameleon perched on a branch (Figure 3). This statue is mounted on a decorative rock slab and is several feet tall. The bronze plaque in front of the statue reads: "JACKSON'S CHAMELEON by Bob Lockhart Donated by Dorothy and Wendell Cherry and the Humana Foundation."

Attached to the outside wall of one of the buildings are stone tiles depicting five species of reptiles and one frog. These tiles are approximately 15 inches square. Figure 4 shows the head of a rhinoceros iguana; Figure 5 shows the head and snout of a gharial; Figure 6 shows most of an unidentified tree frog on a branch; Figure 7 shows the head of a tuatara; Figure 8 shows what I think is the head of a Komodo dragon; and Figure 9 shows the head, the tail and part of the body of a snake that I think represents a species of boa or python.

Throughout the zoo there were several Lego® statues of different animals. Figure 10 shows a Lego® statue of a chameleon perched on a branch. There was a poster that said, "Jeweled Chameleons live in Madagascar" and identified the artist as Sean Kenney who used 49,034 bricks in this statue and worked a total of 511 hours to build it. Figure 11 shows two views of a Lego® statue of a sea turtle emerging from its egg. A poster next to the statue said, "Leatherback sea turtle conservation status: vulnerable" and identified the artist as Sean Kenney, who used 57,462 bricks and worked 482.5 hours to build it. In other areas of the zoo the non-herp Lego® statues included a dodo, a hummingbird, a coral reef seascape with seahorses holding onto branches of coral, and a Monarch butterfly. All of these Lego®

statues were several feet tall, very colorful with red, yellow, orange, green, blue and other colors, and all were identified as built by Sean Kenney using thousands of bricks and taking hundreds of hours to build each statue. These Lego® statues were apparently a temporary display; they weren't there in 2019.

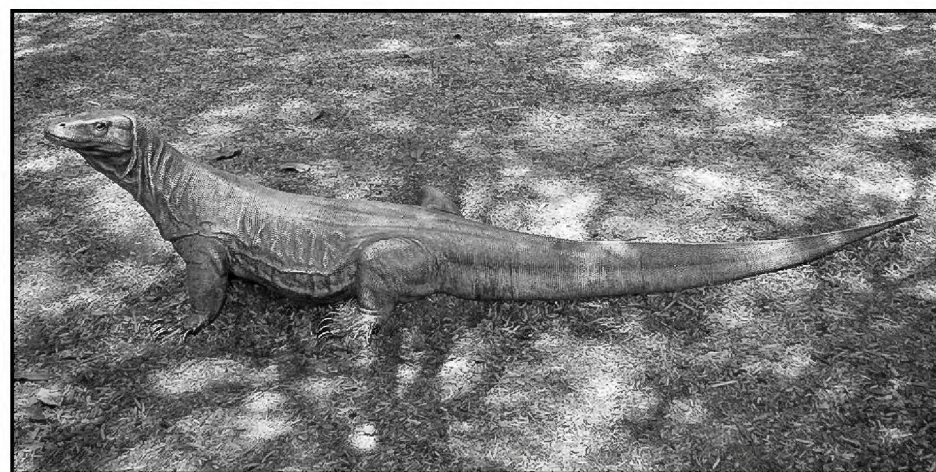


Figure 2.



Figure 3.



Figure 1.



Figure 4.

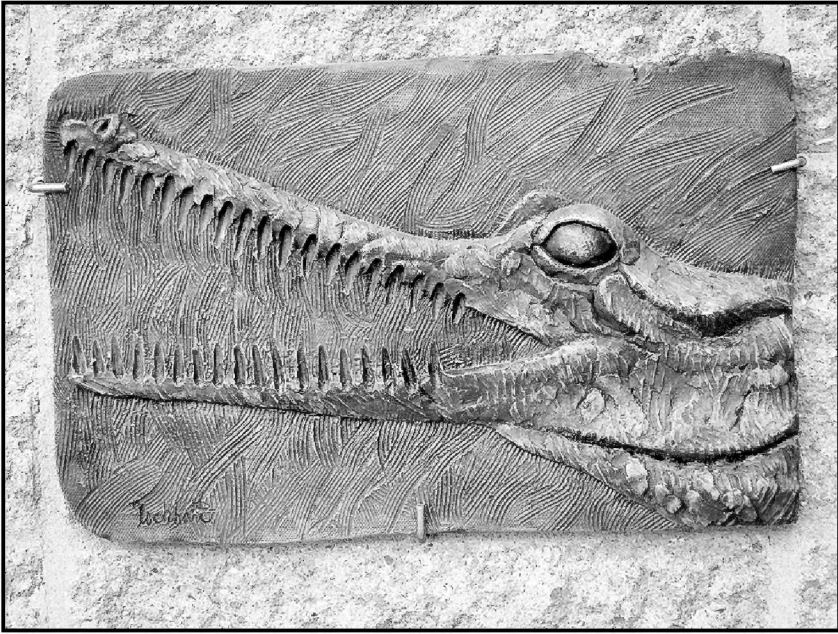


Figure 5.



Figure 6.



Figure 7.



Figure 8.

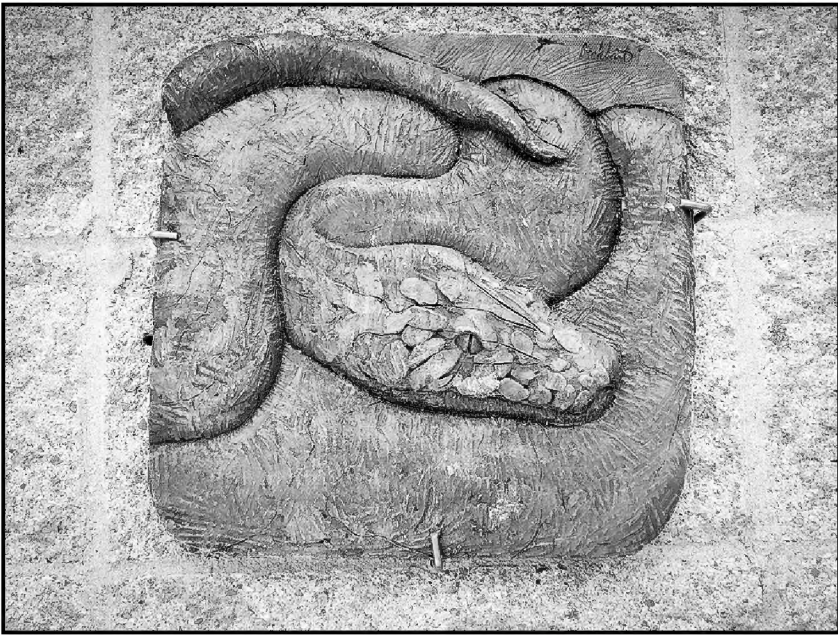


Figure 9.

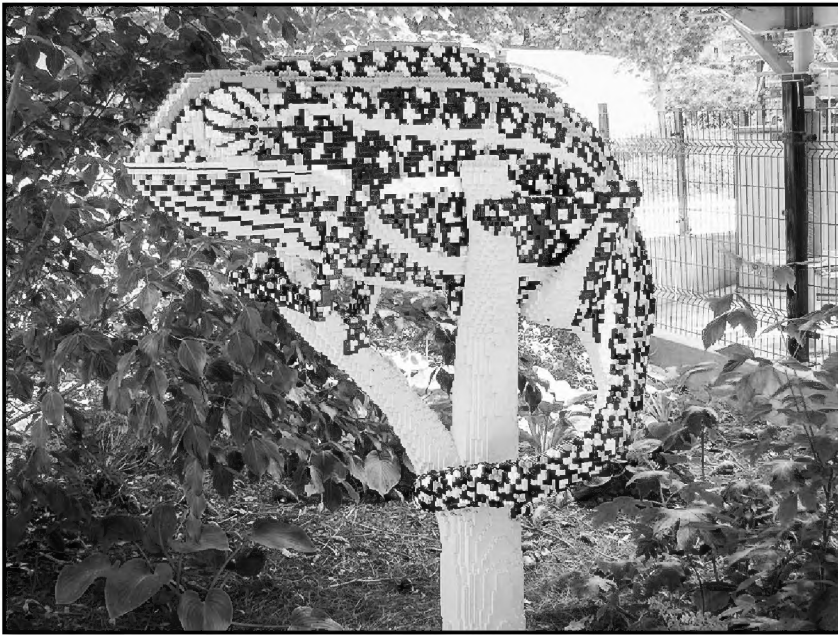


Figure 10.

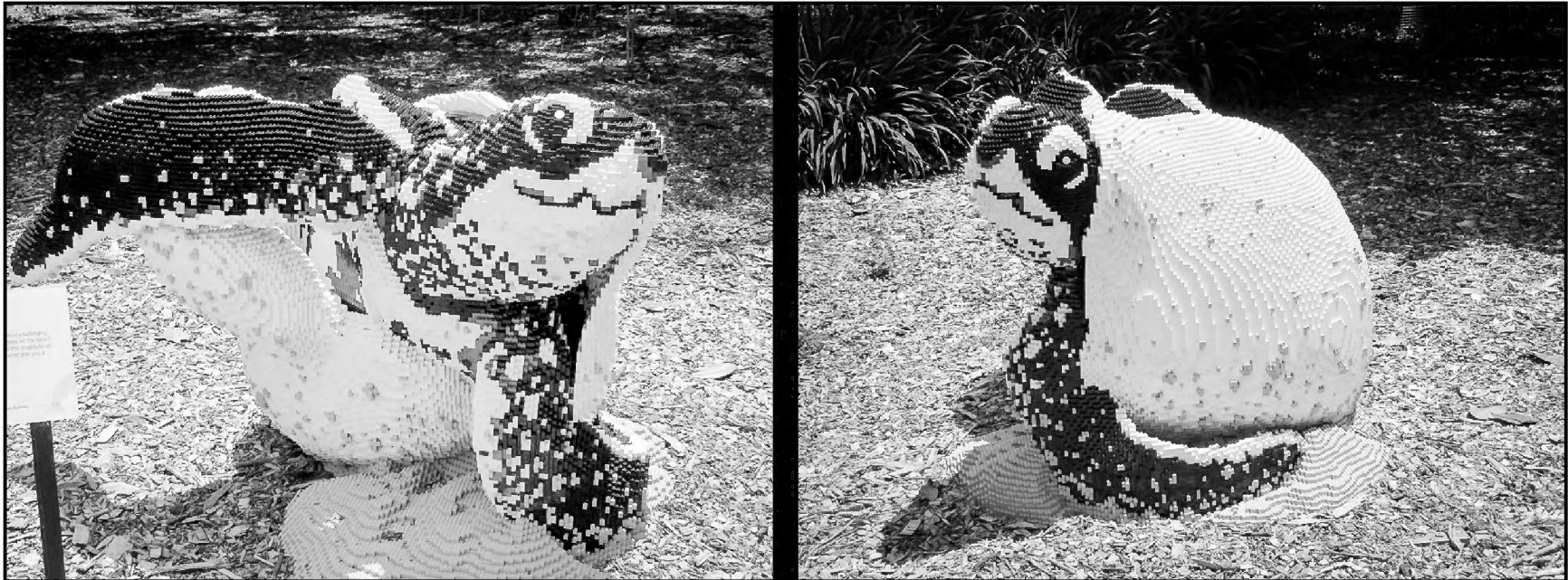


Figure 11.

Adventures with Dr. Rosen — Part 3, Cienega Creek

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Project FROG

This column will be the last one that I do on the subject of Dr. Rosen for awhile. At this point in time, I have over 25,000 more words that I wrote about this man stashed safely away. That is roughly five more columns worth! Some of these are quite column-worthy, and may be brought into play at any time. (Look for one about Checkered Gartersnakes in the near future.) To say that I admired this man would be an understatement. I have suddenly realized that I can't keep blathering on and on about him to you folks. I could easily still be writing about him a year from now. But I don't wish to stop without first telling you of one of the greatest feats in conservation biology that I have ever witnessed. It was performed at a place called Los Cienegas National Conservation Area, which I will shorten to Cienega Creek for the remainder of this column. Phil was part of a gang of four people who named themselves "Frog and Fish Restoration Group," which they somehow converted to the acronym "FROG." (I'm having difficulty forming that acronym out of those words. But in light of what they accomplished, I will call them anything they wish to be called.) The people involved with FROG were Phil Rosen, Dennis Caldwell, David Hall and Netzin Steklis. To call this group the A-Team of herp conservation and restoration would not be an exaggeration. To be sure, they received a hefty grant from the National Fish and Wildlife Foundation to perform their mission. But they earned every penny of that money.

In short, their mission was to prepare a 444-square-mile region for the reintroduction of Chiricahua Leopard Frogs (*Rana chiricahuensis*). There were also native fishes involved, but those *won't* be included here.

Pursuant to the good work that FROG performed, I have two documents in hand. The first is dated 20 March 2011. It is actually a scope of work statement for how team FROG meant to approach accomplishing their goal. It is 36 pages long, contains many maps, and a detailed chart that describes ambitious modifications for 22 different cattle tanks (ponds) along the course of the Cienega Creek riparian corridor, as well as its tributaries. The second document is the final report of what they accomplished as the result of their efforts, having worked their asses off in the process. It is dated 29 July 2013, and includes a list of 48 different entities — agencies, elementary schools, high schools, universities, zoos, herp societies, private landowners and cattle ranchers — who were either involved or affected by the effort. This document is 150 pages long, and staggering in its magnitude. These two documents are an excellent road map for anybody who ever wants to get involved in the conservation aspect of wildlife biology. Should any interested party wish to see these documents (Caldwell et al., 2011; Rosen et al., 2013), please contact me.

I am going to come back to all of this shortly. First, I want to

pull Phil out of his role with FROG in order to lay some more accolades on him personally. I also see the need to explain a few things about Bullfrogs and crayfish to this audience. We resume the story of Phil's team-effort role with FROG under the bold-face heading "Team FROG and Cienega Creek Restoration."

Extraordinary tributes to an extraordinary man

I have just finished reading the many outstanding tributes to Dr. Rosen that were contained in the December 2020 issue of the *Sonoran Herpetologist*, which is the newsletter of the Tucson Herpetological Society (THS). This is yet another article that would be of interest for anyone wishing to become a successful conservation biologist. You may access it by going to the THS homepage at <tucsonherpsociety.org> and selecting "Current Issue of Sonoran Herpetologist." Scroll down to page 109 for "In Memoriam: Remembering Philip Clark Rosen, 1955-2020" (THS board and membership, 2020). *Please note: this issue will only be freely available to nonmembers of the THS until March 2021.*

Dr. Phillip C. Rosen's celebration of life occurred on the late afternoon and early evening of 1 October 2020. It was held outdoors, on the patio of the Mission Garden Park, which is a recently established and growing affair that helps to define the history and cultures of not only the people of our region, but the plants and animals as well. Phil was so highly regarded that over 50 people attended, despite the potentially dangerous consequences of doing so. Yeah, we all masked up and tried to socially distance, but there was grave danger at the microphone that night. One by one, people would step up to the microphone to say their words. Each time they did, their mask would be whisked downward, and between speakers, *nothing* was done to sanitize the podium *or* the microphone. Fifty of Arizona's most notable herpetologists and conservation biologists were all basically swapping spit at that mike. Fortuitously, through a process best described as more luck than brains, nobody died. No harm, no foul. I went to the ceremony prepared to say my piece, herper spittle notwithstanding. I was actually going to say something about that one thread that Dr. Rosen and I had in common. We speak of the field documentation that both of us have faithfully scrawled into our respective herp journals through the decades. The one thing that I definitely understood more than anybody else attending that ceremony is the sense of responsibility and duty that is an indirect consequence of our own diligence. To put it bluntly, by relentlessly documenting everything we did, we each hung an albatross around our own neck. I know that the last six months of Phil's life were a mad scramble to get this all organized for whatever higher purposes exist. I hope he realized that even if he didn't lift a finger to do anything more, what he *had* done was big enough to call his efforts in life "good." While my wife Dianna and I were on the way to the ceremony, she asked me if I knew what I was going

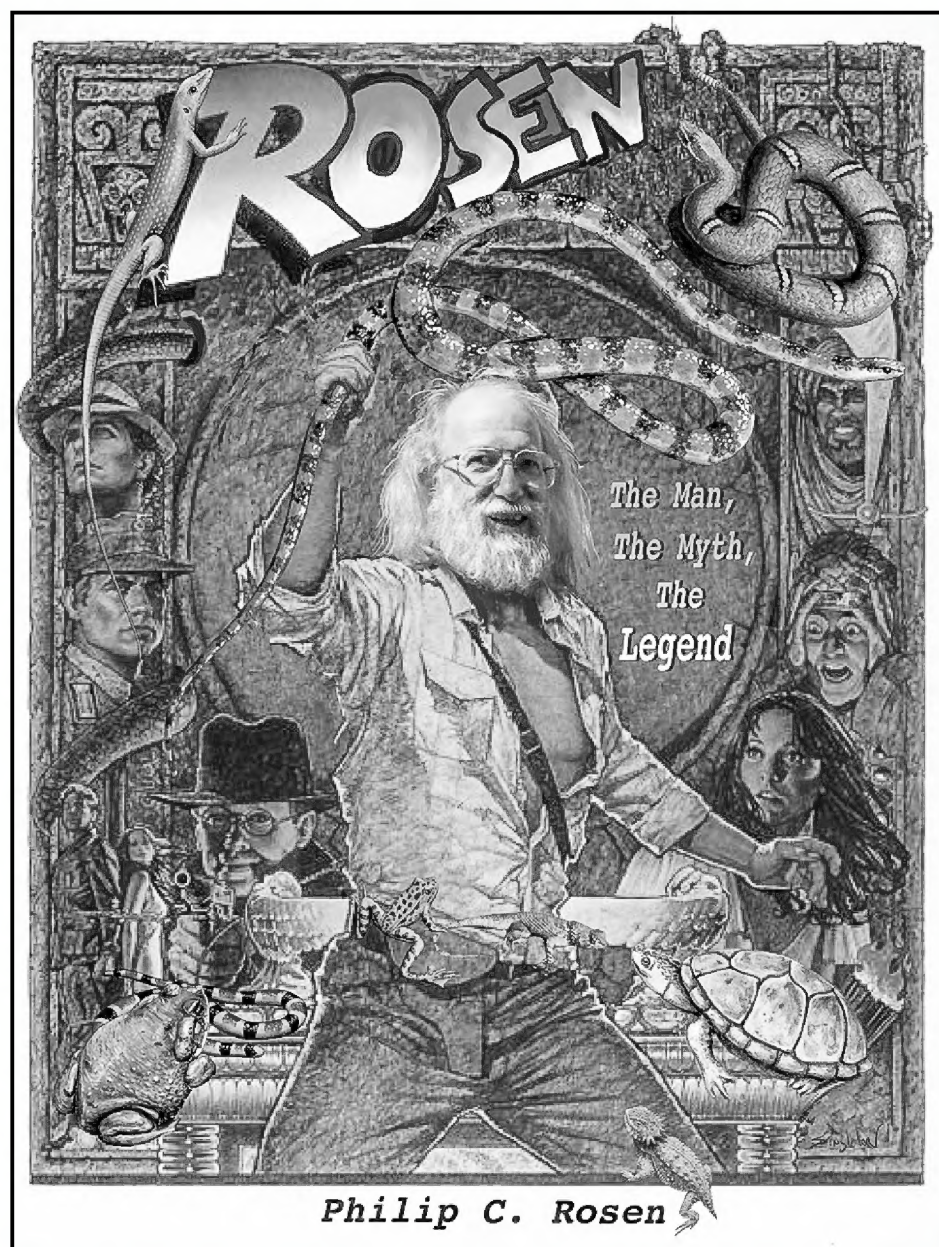


Figure 1. The poster created by artist Bill Singleton for the celebration of life ceremony honoring Dr. Philip Clark Rosen. The likeness and manner of dress are hilariously Phil all the way. Note that Dr. Rosen stands ready to whip the world into shape with a Western Groundsnake (*Sonora semiannulata*).

to say. When I responded in the affirmative, she offered to be my springboard. Grateful for the opportunity, I belted it out—right up to the point of our mutual diligence and ye old albatross necklace. At that point, she sagely told me “Don’t say *that!*” (Every herper ought to have a wise spouse like Dianna!) Even though it *is* the truth, perhaps those closest to Phil weren’t ready to hear it. As I had less than 24 hours notice to prepare for this event, I had thought of only one other story. That one involved me almost shooting Phil when we were doing a nocturnal herp survey on some very harrowing ground near the Mexican Border. My speech might have been: “Hey everybody! I almost shot Phil a while back. It’s a good thing that I didn’t, or we would have done all this 17 years ago. And I probably would *not* have been invited.” In the end, I said nothing at all. That was probably for the best, as I’ve done too much talking and not enough listening lately anyway.

An artist by the name of Bill Singleton put together a poster of Dr. Rosen for his celebration of life. Its obvious comparison of Dr. Rosen to Indiana Jones is creatively hysterical. I am pleased to pass this on to you (Figure 1). Sadly, I do not know Mr. Singleton. I *do* hope to meet him someday, if for no other reason than to thank him for doing this magnificent piece. The rendering of Rosen is great! Looking beyond the imposing figure of Dr. Rosen in Figure 1, we see a few species of amphibians and reptiles scattered about. Although I am a huge fan of artistic license, I am somewhat mystified by the presence of some herps that are present, as well as some that are missing.



Figure 2. Bullfrog (*Rana catesbeiana*). They are the author’s favorite froggies from back East, but they are *not* welcome in Arizona. They multiply quickly, and lay waste to the smaller native fauna with their voracious appetites (see Figure 3). Image by Steve Barten.

But I *do* understand the significance of some of what *is* there. In deference to column length, we choose *not* to discuss every herp to share this celebration of life meme. We instead direct your eyes to the leopard frog that is poised on the flap of Phil’s holster, and the mud turtle below his left hand. Leopard frogs and mud turtles played a big role in that which will follow in this article.

Bullfrogs *ain’t* welcome here

I have a confession to make. I love Bullfrogs (*Rana catesbeiana*) (Figure 2). When I was about 14 years old, I caught a *monster* along the banks of the Fox River. He was a handful for sure—one enormous froggie! I named him Luigee. He actually earned first place at one of the Chicago Herpetological Society herp shows. I even got a trophy—which meant more to me than any of the ordinary baseball trophies in my possession. What impressed me the most about Luigee was his eating prowess. He’d gobble down two mice per feeding. He’d choke each down in two gulps. No doubt encouraged by my prodding them on their little backsides with my snake hook, a hapless white mouse would wander past Luigee’s enormous head. Luigee would lean forward, smack that mouse upside the head with his tongue, and snarf the entire body into his cavernous gullet. The pink tail would still be dangling out of his mouth, wiggling away in helpless protest to the powerful acids that were already starting to melt its face. Luigee would then sort of bend his neck downward, and then throw his head back, while using his forelimbs to sort of stuff that tail down. There would next ensue a series of retching facial expressions and body contortions that were so disgusting to watch that even Jabba the Hutt might have puked at the sight of it. But eventually, Luigee would choke it all down, and be ready for the next one. At the same time that Luigee was under my care, I had a massive female Diamond-backed Watersnake that I was keeping. She dropped 33 babies. At first, I thought I was going to be a rich young man, and make a killing off selling them. That was *before* I found out how *worthless* neonate watersnakes of any kind are. However, for a couple of months, the cute little nippers did become a steady food source for Luigee. I limited him to three per feeding. All

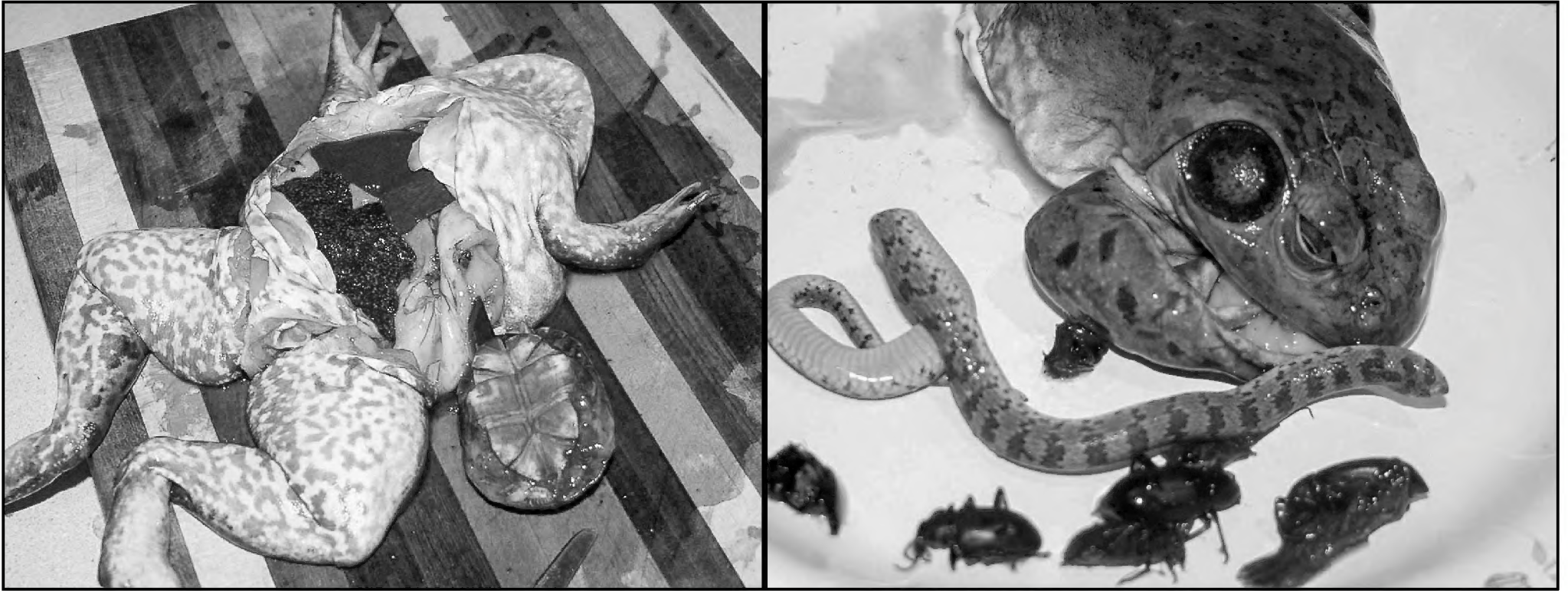


Figure 3. Dissected Bullfrogs from Cienega Creek depicting prey items in digestive tracts. (Left): A Sonoran Mud Turtle (*Kinosternon sonoriense*). (Right): A Chihuahuan Hook-nosed Snake (*Gyalopion canum*). The latter is particularly disturbing, as they are only rarely seen in Arizona. Images by Dennis Caldwell.

three would go down the hatch in “Blip! Blip! Blip!” fashion. Thanks to my propensity for gathering wild food sources for my pets, I am also an encyclopedia of knowledge with most of the potential prey items for Bullfrogs. We can certainly add Leopard Frogs, Green Frogs, two species of shrew, young voles, baby ground squirrels, and the occasional wounded sparrow to the menu. I never tried young turtles — mainly because even in my worst herp-feeding-frenzy days, I *did* have a few scruples. Regardless, I still hear from old friends who tell me that they miss feeding time at the Repps.

Luigee eventually croaked. Details are completely lacking in my feeble brain. But he died — count on it! I moved away from Illinois, eventually landing in Arizona. In 1988, the Tucson Herpetological Society was founded. When I went to my first board of directors meeting, I was *appalled* to hear some of the directors talking about participating in the mass extermination of Bullfrogs. I’m sure that I showed my rookie status by asking them why they were doing such things. They tried to explain it all proper, but I wasn’t buying it then. *Now* I get it. And today, 32 years later, the talk is *still* “we must eliminate Bullfrogs” because after tens of thousands of dollars in grants, and a *lot* of hard work — they are still here!

I will try to explain the problem that Bullfrogs present here in Arizona specifically, and the southwestern United States in general. It would take an entire book to explain why they are not welcome here. But I laid down a lot of the groundwork by explaining the feeding habits of my pet Luigee. The darn things eat anything that they can choke down. While that is true back east as well as here, the advantage of an abundance of ponds, lakes, streams, creeks and rivers back east helps to diffuse the effects of this ravenous predator. In fact, Bullfrogs were downright rare in the places that I herped when growing up. Luigee was the only really big Bullfrog that I ever saw in my 23 years of living in the northwest suburbs of Chicago. I now live in Arizona, where I can see over 50 such monsters in a single night! Here, places wet enough to support *any* type of frog are rare and widely separated. The nature of a dry landscape forces frogs to compete for survival in extremely limited spaces. Once Bullfrogs find purchase in such places, they multiply prolifi-

cally, and flat out eat *everything* herp-wise that would normally inhabit whatever stretch of stream or pond they have invaded (Figure 3).

Any reader of these words might be inspired to say “Why don’t you just eradicate them in the places where they aggregate?” Good question! You guys ask the *best* questions! Even had I put the words in your mouths, you could *not* have asked a better question at this point in the column. The answer to that is this: “It isn’t that easy.” Even if you drain every pond that you find them in (it has been tried), and remove their eggs and tadpoles in the process (that has happened many times over as well), come the next rain, another batch will move back in from somewhere else. No, if you want to eradicate Bullfrogs, you have to approach the problem on a landscape basis. You have to start at the top of every niggling drainage that might harbor either a spring or a deep *tinaja* (a pool formed in bedrock), kill them all there, and work your way down to the mouth of each of these drainages. Only then you can deal with the populations that have established themselves at the valley bottom.

That, my friends, is *exactly* what team FROG did for Cienega Creek.

Crayfish ain’t welcome here either

In much the same fashion that Bullfrogs became a menace to all watercourses here in Arizona, the story is the same with crayfish. It has been a popular opinion to blame Arizona Game and Fish for *both* problems, as both problems can be traced to the practice of using *both* for fishing bait. And historically, what did every fisherman do with any leftover tadpoles or crayfish remaining in their live bait buckets at the end of a fishing outing? Why, they dumped them out of the bucket and into whatever lake or river that they were fishing in that day. Game and Fish outlawed both as legal bait over 30 years ago, but the damage had already been done. Where Crayfish are concerned, not only do they devour any small herp or native fish every chance they get, they also eat the native plants! If you think you can stomach it, see Figure 4. Know that the same fate awaits Mexican Gartersnakes and tadpoles of native species of frogs.



Figure 4. Crayfish are another introduced species that are laying waste to Arizona’s riparian corridors. In this image, we see a young Sonoran Mud Turtle (*Kinosternon sonoriense*) in the process of being held under water. Had photographer Phil Fernandez not intervened, the hapless turtle would have drowned and been scavenged.

Once again, the fine folk of FROG went after crayfish. But as their final report plaintively states, they didn’t quite get them all. But they have managed to quarantine their one and only stronghold at Cienega Creek (Rosen et al., 2013).

Team FROG and Cienega Creek Restoration

As already mentioned, the people involved with FROG were Phil Rosen, Netzin Steklis, Dennis Caldwell, and David Hall. In title, Phil and Netzin were the Principal Investigators, Dennis was the Outreach Coordinator, and David was the Field Coordinator. But I would imagine that they all wore many hats for the duration of the project. In early 2010, the team received a grant from the National Fish and Wildlife Foundation “for restoring Leopard Frogs and habitat in a key sky island habitat.”

As the biographer of this effort, I admit to performing a little guesswork to everything that follows with the efforts of team FROG. If anything that follows is grotesquely wrong, I wish the lot of them better luck with future biographers! While I can’t say exactly who did what, I *can* say that through my accidental association and friendship with Dennis Caldwell, I was witness to developments along the Cienega Creek Watershed from 1990

to 2015. At first, the two of us went there to casually herp, and then, Dennis began to work for the Bureau of Land Management (BLM)—the government agency that manages and monitors the watercourse. I made a lucky visit to Dennis here in June of 1998 while he performed his surveying duties. For once, my presence was lucky for *him*, as I snapped some images of cattle damage (Figure 5), *and* learned that he had not yet found a breeding population of leopard frogs along the southern stretch of the creek. The lack of a breeding population knowledge became important for me to know when in March of 1999, a visitor from Washington State by the name of Steve Zimmerman and I found four Chiricahua Leopard Frogs (*Rana chiricahuensis*) in an obvious but undiscovered location. Dennis responded to this information with unabashed praise and gratitude—perhaps the first and only time he has done so for anything I’ve ever done. Saying something nice to me must have been hard on Dennis, for he has now forgotten all aspects of this discussion—and I no longer have the emails. It is just another classic example of: When I do something good, nobody remembers. When I do something bad, nobody forgets!

I later learned from Rosen (personal communication, June 2019.) that Jeff Simms, an agent for the BLM, also had knowledge of this population before Steve and I found it. Since Dennis was working for him at the time, perhaps Jeff was waiting to see if Dennis would turn up this population with his own surveys? In any case, it doesn’t really matter. What *does* matter is that team FROG had a source for gathering leopard frog eggs and tadpoles to rear and release when all was made ready. My last trip to Cienega Creek was 14 July 2015—after the entire project was deemed complete. We will relay my own impressions of this successful reintroduction below:

14 July 2015

The trip that Dennis and I made on this day was at my own initiation. I had been pining to see the place again for a number of years, and finally put in my request to Dennis to take me there. It was not long after that request that we went. We followed the creek for miles, stopping at various ponds along the way. My notes indicate that we saw “100s of RACH,” (RACH being an abbreviation for Chiricahua Leopard Frogs (*Rana chiricahuensis*)) (Figure 6). When I was there with Dennis in the 1990s, we



Figure 5. (Left) Extreme example of what can happen to a pond when cattle are allowed in as opposed to (Right) ponds where cattle are kept out. At Cienega Creek, the cattle are fenced out, but water is pumped from the ponds for their needs. Images by the author.



Figure 6.: (Left): Chiricahua Leopard Frog (*Rana chiricahuensis*) from Cienega Creek. Image by Dennis Caldwell. (Right): Twelve *Rana chiricahuensis* viewed alive and thriving in one of the improved cattle ponds. The author viewed “100s” of *Rana chiricahuensis* on the date this image was taken, which was 14 July 2015. That was two years *after* Dr. Rosen and team FROG concluded their restoration project.

didn’t see a one! I can also say that I liked what team FROG did here in a number of other ways. One of the most important accomplishments was to make the restorations amenable to cattle ranchers and leopard frogs alike. Team FROG was dedicated to making this restoration a win-win scenario for everyone involved. They added or enhanced usage of massive ground pumps to some of the springs there, and enlarged the ponds. They then fenced the cattle out of these ponds by using long lengths of steel tubing welded in parallel rows. The gaps between the rows

of tubing were large enough for deer and pronghorn antelope to gain access to the water, but formed a barrier to the cattle. For the cattle, water was pumped out of these ponds and into troughs located outside of the fencing. The cattle were kept out, and the rest of the wildlife got in! Two signs posted just outside Cottonwood Pond explain to visitors some before-and-after situations of the effort. They also mention the help of local high school students with the project, as well as the utilization of the Cienega Watershed as a training ground for biologists (Figure 7). I hope

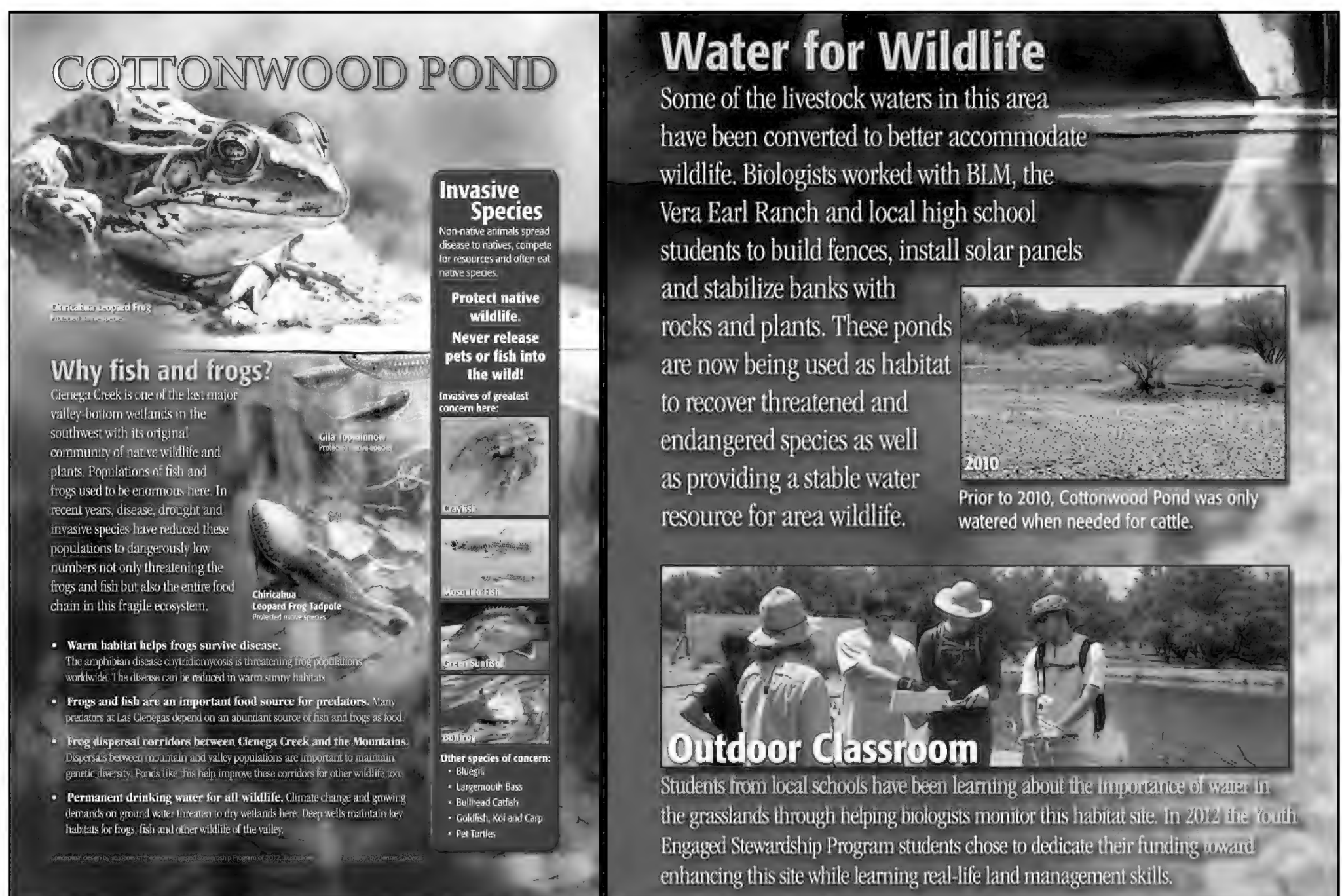


Figure 7. (Left): Educational sign placed outside Cottonwood Pond informs visitors of the dangers of introduced pests, and emphasizes the importance of maintaining the smaller native fauna. (Right): Flip side of sign discusses the marriage of the BLM, biologists, cattle ranchers, and industrious high school students to build and maintain the stability of Cienega Creek for future generations to enjoy. Signs by Dennis Caldwell.

that those who visit the place understand and appreciate the significance of the effort. On this outing, Dennis and I continued westward along Gardner Canyon, which is one of the main feeder tributaries of Cienega Creek. We went all the way to the source of Gardner Canyon—a distance of perhaps five miles—encountering leopard frogs all the way up. At the end of this day, I was inspired to write the following words into my field journal. Up until now, it was a note written only to myself. I am pleased to share these words with the readers of the CHS *Bulletin*: “Well-needed get together with Dennis Caldwell. Team FROG has done a heroic and yeoman’s job at re-establishing RACH (*Rana chiricahuensis*) in the area. There has been a great dispersal of RACH all up and down the Cienega Creek watershed. Good stuff!”

Good stuff indeed! As I finish writing these words, more and more information of Dr. Rosen’s accomplishments in life keeps passing before my eyes. Even though he is no longer with us, I

can’t keep up with him! It was only due to my accidental and infrequent appearances at Cienega Creek that I was able to witness the hand of Rosen, and the good that resulted. It would not surprise me at all to one day discover: “That was *nothing*! Check *this* out!” A fund has been established by the Tucson Herpetological Society to continue to mine his data, and make his research readily available to any who seek it. Further information can be found in the December 2020 issue of the *Sonoran Herpetologist* cited below.

Rest well, old friend, and know that even death won’t stop you from making a difference in the places that you loved, the animals that you studied and promoted, and the friendships and alliances that you formed. You done splendid.

This here is Roger Repp, signing off from Southern Arizona, where the turtles are strong, the snakes are handsome, and the lizards are above average.

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Minutes of the CHS Board Meeting, December 3, 2020

A virtual meeting via Zoom conference video/call was called to order at 7:43 P.M. Board members Rich Crowley, John Gutierrez and Mike Scott were absent.

The meeting was held early in the month to inform the board of the election results. Kyle Houlihan and Jenny Hanson were co-chairs of the 2020 Nominating Committee. Jenny announced the results and reported that 12 mail-in votes and 37 online votes had been received and tallied.

It was agreed that monthly general meetings should resume in the form of Zoom webinars, to be held on the last Wednesday evening of each month. Jessica Wadleigh was asked to invite Steve Barten and Cindy Steinle each to present 30-minute programs at the December 30 meeting. Suggestions were made for possible future speakers.

Other topics discussed were sending a monthly email to members to remind them of upcoming meetings and events, the status of the Junior Herpers group, and the challenge of funding for the CHS in the absence of ReptileFest.

John Archer announced that new board members would be provided with @chicagoherp.org email addresses, and encouraged them to use it for society business.

Kyle Houlihan will continue posting on Facebook about our upcoming meetings.

The meeting adjourned at 8:43 P.M.

Respectfully submitted by recording secretary Gail Oomens

Herpetology 2021

In this column the editorial staff presents short abstracts of herpetological articles we have found of interest. This is not an attempt to summarize all of the research papers being published; it is an attempt to increase the reader's awareness of what herpetologists have been doing and publishing. The editor assumes full responsibility for any errors or misleading statements.

EFFECTS OF CAPTIVITY ON GOLDEN MANTELLAS

L. F. Passos et al. [2020, The Herpetological Journal 30(1):13-19] point out that coloration is an important trait for social communication in amphibians, being used in intra- and intersexual signaling to express information about individual body condition and health state, among other things. The striking colors exhibited by some anuran species are also used in aposematic signals to advertise unpalatability to predators. The aim of this study was to investigate how the captive environment affects the color of golden mantella frogs (*Mantella aurantiaca*) by comparing captive-reared frogs with wild conspecifics. A USB-2000 portable diode-array spectrometer and a xenon strobe light source were used to perform spectrophotometric measurements on captive and wild populations. Hue, chroma and brightness of skin color were analyzed as well as body condition using the scaled mass index. Analyses showed variation among populations, but significant differences were only found between captive and wild populations. Models were used to evaluate the effects of body condition on color variation and showed that animals with lower body condition from one captive population had significantly different coloration than their wild counterparts. Importantly, one captive population was not greatly different in coloration from their wild counterparts—demonstrating that this problem is not inevitable in captivity. These results can have important implications for reintroduction programs.

DIET OF INVASIVE NILE MONITORS

F. J. Mazzotti et al. [2020, Journal of Herpetology 54(2):189-195] note that Nile monitors (*Varanus niloticus*) have been reported from southeastern Florida near the Homestead Air Reserve Base in Miami-Dade County, around Southwest Ranches in Broward County, and from a reproducing population along the C-51 canal in Palm Beach County. This study characterizes the diet of Nile monitors removed from Palm Beach and Broward counties. In 2012, Florida Fish and Wildlife Conservation Commission staff and University of Florida researchers began monthly boat surveys along the C-51 canal and driving and walking surveys in Southwest Ranches. The study used Nile monitors removed with firearms or live traps from southeastern Florida from 2012 to 2016. The authors extracted gastrointestinal (GI) tracts and collected gut contents. They rinsed, sorted, dried, examined, and identified gut contents to the lowest taxonomic level possible. They examined 68 GI tracts (30 males, 37 females, 1 undetermined) and identified 1,484 prey items from 65 individuals. They categorized prey items as insect, gastropod, diplopod, malacostracan, arachnid, fish, amphibian, reptile, reptile egg, bird, and mammal. Adult Nile monitors exhibited the highest dietary diversity and evenness among size classes, and there was no observable difference in diet between males and females. These observations confirm Nile monitors are active foragers, and the combination of broad diet and active foraging makes it unlikely that food availability will limit distribution of these invasive lizards in Florida.

AN ATTEMPT TO ERADICATE AN INVASIVE LIZARD

C. Adamopoulou and P. Pafilis [2019, Herpetozoa 32:165-169] note that invasive species have been recognized as an important hazard to native communities. Among the mitigation measures that have been proposed to confront biological invasions, eradication projects are certainly the most drastic. The authors report a successful eradication project against a recently established population of the Italian wall lizard (*Podarcis siculus*) in Athens, Greece. To this aim, the Hellenic Herpetological Society received unforeseen aid from stray cats and, possibly, from the ocellated skink (*Chalcides ocellatus*) and vegetation growth. Within three years, the initial thriving *P. siculus* population has shrunk to very few individuals.

THE STREAMSIDE SALAMANDER IN KENTUCKY

A. N. Drayer et al. [2020, Journal of Herpetology 54(3): 299-305] note that for many amphibian species of conservation concern, understanding of drivers of distribution and abundance is based on data collected at only a few localities. Thus, landscape-scale efforts are needed to better inform management and species conservation. The streamside salamander (*Ambystoma barbouri*) is a global conservation priority because of its restricted geographic distribution and presumed sensitivity to forest loss, yet landscape-scale studies have not occurred. The authors surveyed a 16-county area in Kentucky and examined the influence of catchment (forest, agriculture, and urban) and local-scale (water chemistry and sunfish presence) variables on *A. barbouri* occupancy and abundance. They sampled 80 streams across different land cover types (i.e., 30 agriculture, 34 forested, and 16 urban) over 2 yrs (2017–2018). Within these streams, 56 new localities were identified. Estimated mean occupancy ($\Psi = 0.91$; credible interval [CI] = 0.76–0.99) was high. Streams with the highest estimated abundances were those without sunfish and containing >50% forested or agricultural land cover within their catchments; urban streams had the lowest estimated abundances. At sites where sunfish were not detected, there were an estimated 35.25 (95% CI = 32.04–38.67) *A. barbouri* individuals per 10 m in forested sites, 22.47 (95% CI = 19.86–25.14) in agricultural sites, and 0.66 (95% CI = 0.14–1.59) in urban sites. Water chemistry varied across site types; however, only maximum sodium ($\beta = -0.51$, 95% CI = -0.58 to -0.43) was associated with *A. barbouri* abundance. If managing this species becomes necessary, minimizing urban development within low-order stream catchments should be a priority.

Chicago Herpetological Society
Income Statement: January 1 – December 31, 2020

Income		Expense	
Membership dues	\$ 9,881.80	Bulletin printing / mailing	9,508.42
ReptileFest	0.00	ReptileFest	971.96
Donations	4,676.72	Grants and donations	5,000.00
Bulletin back issues	7.75	Rent (storage)	2,465.92
AmazonSmile	11.65	Bank / PayPal / Square fees	320.88
Interest	8.71	Liability insurance	1,261.00
Raffle	93.00	Dues, licenses and permits	549.40
Miscellaneous	250.00	Postage	2,175.54
		Speaker reimbursement	942.02
		General meeting expense	743.71
		Library	277.94
		Adoptions	180.65
Total Income	\$14,929.63	Total Expense	\$24,397.44

Net Income (\$9,467.81)

Chicago Herpetological Society
Balance Sheet: December 31, 2020

Assets

Checking	\$ 3,506.98
Money market	23,475.59
Petty cash--show fund	350.00
PayPal	5,066.88
Postage on deposit	182.54

Total Assets	\$32,581.99
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Liabilities

Credit card	180.00
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Total liabilities	180.00
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Equity

Retained earnings	41,869.80
Net income	(9,467.81)

Total equity	\$32,401.99
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Total liabilities & equity	\$32,581.99
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In Memoriam: Don Wheeler

Words cannot do justice to all that Donald G. Wheeler, who died on December 19, 2020, brought to the Chicago Herpetological Society. Don's awesome talent as an artist was always enthusiastically made available to the CHS. When we needed a logo, Don came up with the perfect one. Countless T-shirt and flyer designs flowed from his pen over the years. When we turned to him for a poster to commemorate our 25th anniversary in 1991, Don not only provided the beautiful artwork, he did the color separation and arranged for its production as well. When ReptileFest first began in 1994, Don suggested that the kids attending might like to have temporary tattoos. He worked nonstop drawing those tattoos at every one of the two-day events for years thereafter. For each of the five Midwest Herpetological Symposia hosted by the CHS, Don generously donated paintings and other examples of his artwork to the Saturday night auction. And at each auction those items became the biggest draw.

And then there is Spot. Don's inventive and superbly drawn comic strip, "The Adventures of Spot," first appeared in the December 1978 *CHS Newsletter*. The strip continued to run there monthly until 1987, when the *CHS Bulletin* went monthly and the newsletter was discontinued. Spot then found a new permanent home on the inside back cover of the *Bulletin*. There can be no question that many of our longstanding members first joined and then stuck with us simply because of Spot.

Don's contributions to these pages were not limited to his Spot cartoons. Cited below are two articles, three book reviews and three letters to the editor that he wrote over the years. An

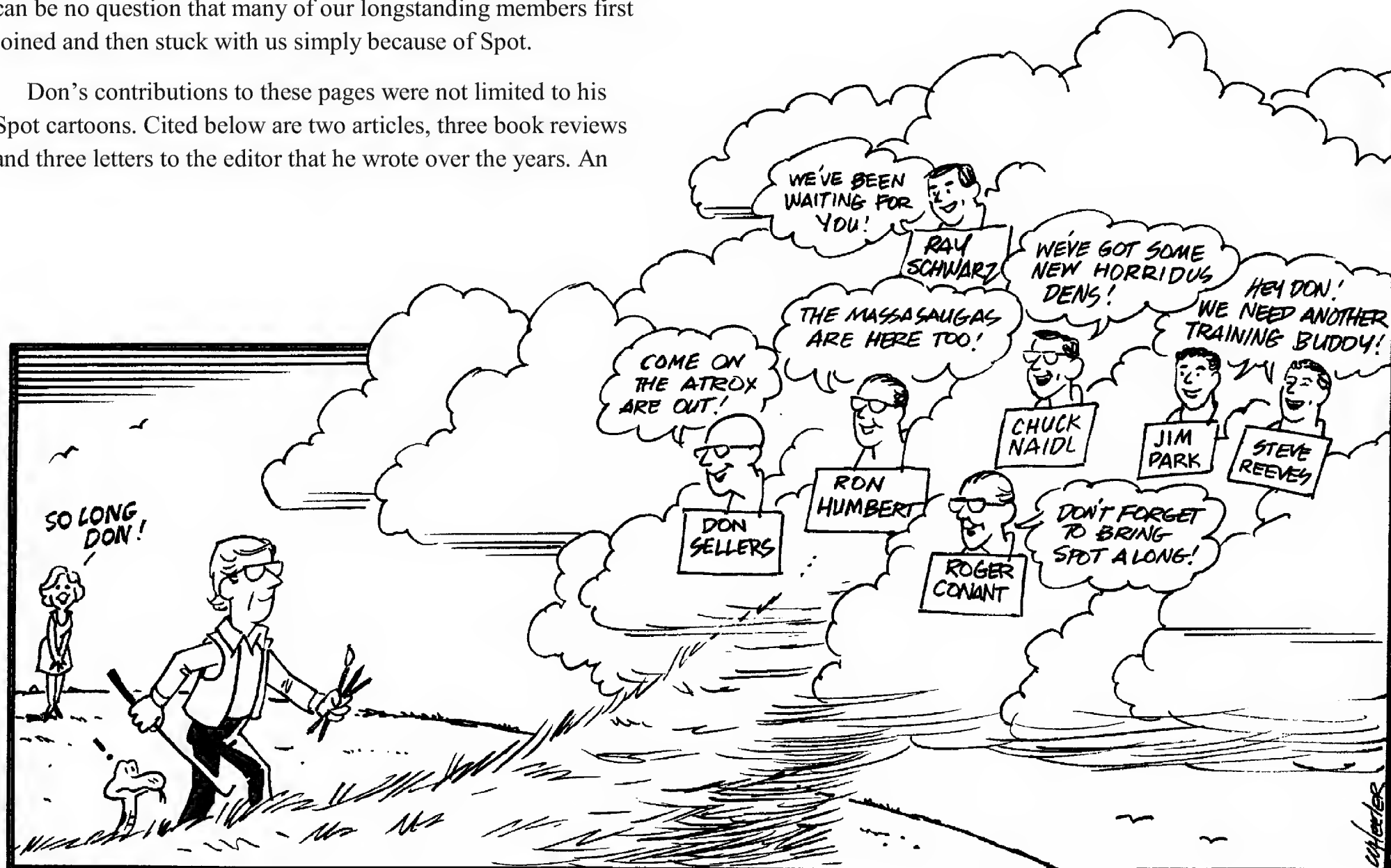


article in the *Bulletin* (Brown et al., 1994) dealt with the conviction for illegal trafficking of a notorious poacher of timber rattlesnakes. Don added cleverly to the impact of the article with a cartoon depicting the culprit in prison stripes. And anyone who viewed Don's heartfelt pictorial farewell to Ron Humbert in the December 2005 *Bulletin* surely remembers it. Likewise, it will be hard to forget the image below that Don made some years ago in preparation for his own farewell.

Born in 1932, Don is survived by his wife Milvi, his sons Ron (Suzanne), Don (Leah) and Greg (Kerrie), and his grandchildren Brittany Gilbert (Chris), Austin Wheeler (Beth), and Kara Wagner (Dylan). Don was a graduate of the American Academy of Art in Chicago, and eventually became a vice-president at the Leo Burnett advertising agency.

In 2000 the Chicago Herpetological Society presented Don with the Lifetime Service Award. That award is given out only rarely to a long-term member for outstanding service to the Society.

In 2001 ECO published *Tales from the Golden Age of Rattlesnake Hunting*, Don's reminiscences of his adventures in search

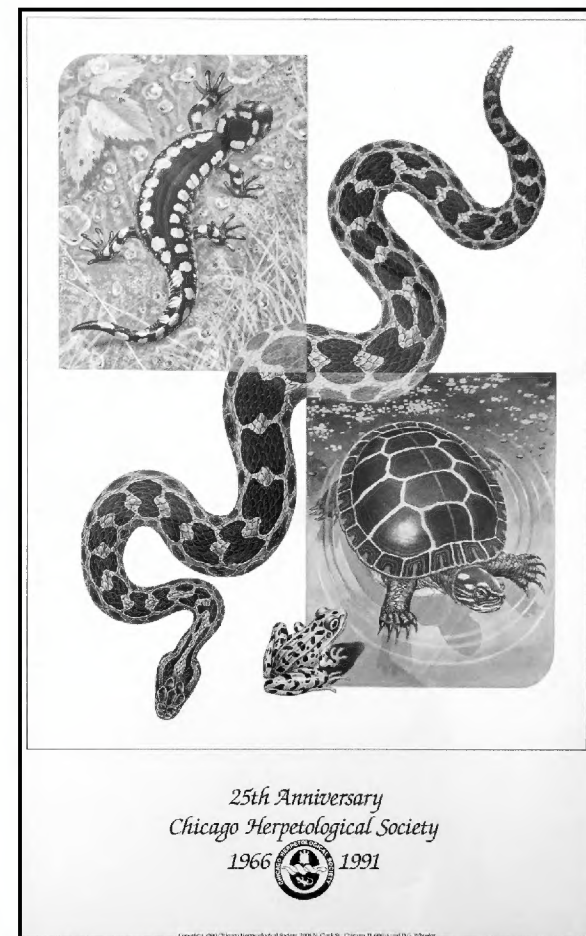




Hard at work at ReptileFest.

of his favorite reptile. In 2007 Don and the CHS co-published *Twenty-five Years of Spot Cartoons from the Bulletin of the Chicago Herpetological Society*.

On a more personal note, I will miss Don's friendship greatly. For introverts like me, such long-lasting friendships are few. We shared many memorable herping trips to places like Wisconsin, Oklahoma, southern Illinois, southern California, southeastern Arizona, the Carolinas and Mexico. And for over 20 years we shared our evening commute home. I can't remember exactly how it began, but we found each other on the same train one evening, and from then on we sat together in our "special" seat in the second car of the 5:25 P.M. METRA Milwaukee North train. Conversations were wide-ranging: from ideas for Spot to



events in the herpetological world and the wider world. I know these conversations were important to both of us because neither of us missed that train very often. After Don retired at the end of the millennium, I continued to sit in the same seat for years, hoping that he might show up and surprise me. But from then on I would see Don only occasionally. We kept in touch, however. I last spoke with him on the phone just one day before his death.

— Mike Dloogatch

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[Note: Issues of the *CHS Bulletin* (1990–2019) are available open access at <<http://chicagoherp.org/bulletins-2>>]

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For sale: **highest quality frozen rodents.** I have been raising rodents for over 30 years and can supply you with the highest quality mice available in the U.S. These are always exceptionally clean and healthy with no urine odor or mixed in bedding. I feed these to my own reptile collection exclusively and so make sure they are the best available. All rodents are produced from my personal breeding colony and are fed exceptional high protein, low fat rodent diets; no dog food is ever used. Additionally, all mice are flash frozen and are separate in the bag, not frozen together. I also have ultra low shipping prices to most areas of the U.S. and can beat others shipping prices considerably. I specialize in the smaller mice sizes and currently have the following four sizes available: Small pink mice (1 day old—1 gm), \$25 /100; Large pink mice (4 to 5 days old—2 to 3 gm), \$27.50 /100; Small fuzzy mice (7 to 8 days old—5 to 6 gm), \$30/100; Large fuzzy mice / hoppers (10 to 12 days old—8 to 10 gm), \$35/100 Contact Kelly Haller at 785-224-7291 or by e-mail at kelhal56@hotmail.com

For sale: **books.** *The Taipan: The World's Most Dangerous Snake* by Paul Masci and Philip Kendall; 1995; 90 pp., many color and b&w photos, some full page; biology, species history, snakebite case histories; (s)—\$40. *A Contribution to the Herpetology of West Pakistan* by Sherman A. Minton, Jr.; 1966; 154 pp., but pp. 90–154 missing and replaced by repeat of pp. 59–90; 36 plates of b&w photos; (s)—\$15. *Amphibians & Reptiles in West Virginia* by N. Bayard Green and Thomas K. Pauley; 1987; 241 pp., 85 color plates; range maps; scarce; (s)—\$50. *Reptiles of North Carolina* by William Palmer and Alvin Braswell; 1995; 412 pp.; 127 b&w figs., 76 color plates; range maps; (h)—\$50. *Amphibians & Reptiles of New Mexico* by Degenhardt, Painter, and Price; 1996; 431 pp., b&w figs., 123 color photos; range maps; (h)—\$35. *The Cold-Blooded Australians* by Gunther Schmida; 1985; 208 pp., numerous outstanding color photos, some full-page, of reptiles, amphibians and freshwater fish; natural history and field observations; (h)—\$20. s=softbound, h=hardbound. All books in excellent condition. Orders of \$25 and over sent postpaid, \$4 postage for under \$25. William Turner, (303) 795-5128, toursbyturner@aol.com.

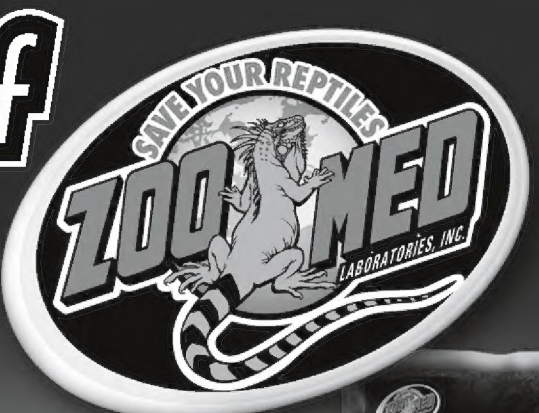
Line ads in this publication are run free for CHS members — \$2 per line for nonmembers. Any ad may be refused at the discretion of the Editor. Submit ads to mdloogatch@chicagoherp.org.

NEW CHS MEMBERS THIS MONTH

Kailey Anderson
Sidney Anderson
Dawn Canterbury
Nicholas H. Coppock
Sara Crayton
Saul F. Dominguez-Guerrero
Lacey Gebbert
Breann Gerald
Karen Jennings & family

Trish Kolberg
Chelsea Kross
Alexandra Martin
John Meek
Don L. Moll
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Jason Peters
Andrew Rubio
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UPCOMING MEETINGS

Until in-person meetings again become possible the Chicago Herpetological Society will be holding monthly general meetings online via Zoom Webinar. A notification will be sent by email to all members who have supplied us with an email address. As has been our custom for over 50 years, the meetings will be held on the last Wednesday evening of each month. The January Webinar is scheduled for Wednesday, January 27, at 7:30 P.M. Chicago time. The program has not been determined as of this writing.

Please check the CHS website or Facebook page each month for information on the program. Information about attending a Zoom Webinar can be found here:

<[https://support.zoom.us/hc/en-us/articles/115004954946-Joining-and-participating-in-a-webinar-attendee->](https://support.zoom.us/hc/en-us/articles/115004954946-Joining-and-participating-in-a-webinar-attendee-)

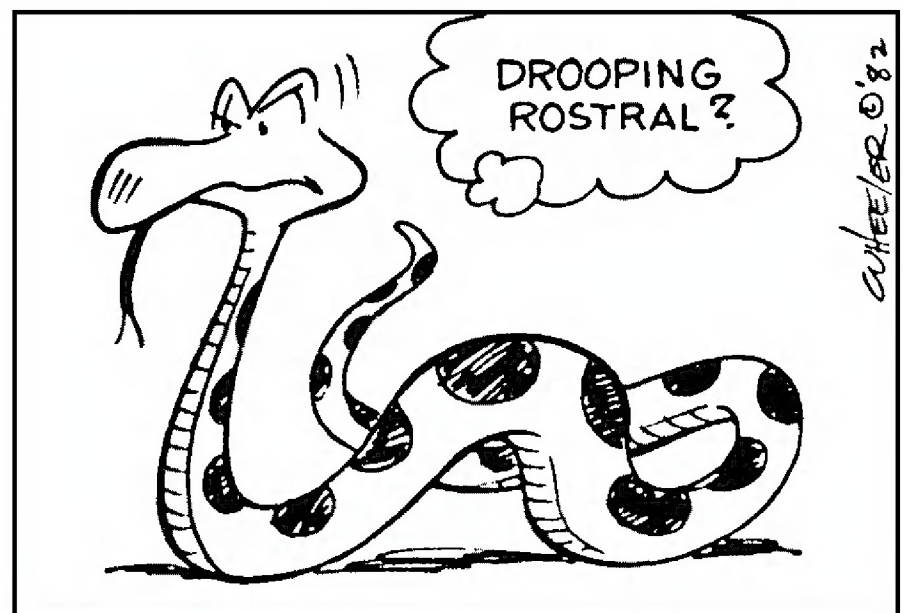
Board of Directors Meeting

Are you interested in how the decisions are made that determine how the Chicago Herpetological Society runs? And would you like to have input into those decisions? The next board meeting will be held online. If you wish to take part, please email akolb@chicagoherp.org.

THE ADVENTURES OF SPOT

Cartoonus herpetologicus chicagoensis
COMMON NAME: SPOT

- HABITS AND HABITAT: EMERGES ONCE EVERY MONTH. TYPE SPECIMEN CAN BE OBSERVED BY MEMBERS OF THE C.H.S. AMONG THE NEWS AND INFORMATIVE ARTICLES OF THE C.H.S. NEWSLETTER. VENOMOUS ONLY ON OCCASION. BITE IS NEVER SERIOUS, ONLY HURTS WHEN YOU LAUGH.
- AVERAGE LENGTH: LONG ENOUGH FOR ANY SITUATION.
- HEAD: DISTORTED, SILLY LOOKING, PUFFY CHEEKS, LARGE DROOPING ROSTRAL, BIG EYES, ROUND PUPILS.
- BODY: SLIM TO FAT (DEPENDING ON SITUATION) PATTERN CONSISTS OF 10 TO 20 SCRIBBLY BLACK SPOTS ON A WHITE GROUND COLOR. (OCCASIONALLY OCCURS IN A CHARTREUSE COLOR PHASE.)
- DIET: PREFERS CHOCOLATE COVERED PINKIES.



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CHICAGO HERPETOLOGICAL SOCIETY

Affiliated with the Chicago Academy of Sciences

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